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HISTORY OF THE BEET SUGAR INDUSTRY IN CALIFORNIA

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A. IN EUROPE

In these days of heavy sugar consumption it is almost impossible to imagine the time when this article could be purchased only from the apothecary's shop in small quantities, or when a Queen of France had for her year's allowance four rather small loaves of sugar, valued at \$5.75 a pound.¹

Cane sugar is an older article of commerce than beet sugar. It is supposed to have come from India, and was referred to by the Europeans as "the sweet sticks of the East". When the Byzantines conquered Persia in 627 A. D., sugar formed part of the booty. From the Greek Empire the sugar trade soon passed westward to Venice and Spain. The former city became the sugar market of the world in the fourteenth century, following the discovery of the art or refining.²

The sugar beet was known to the Romans and cultivated by them, but they were ignorant of any method of sugar extraction from the beet. Returning barbarians from the Roman Empire carried the beet into Bohemia, where it was cultivated, but not for its sugar content.³

The epoch-making discovery of extracting sugar from the beet was made in 1747 by a German chemist of Berlin University, Andrew S. Marggraf. His discovery did not yield immediate consequences, and was forgotten for half a century, when Francis Karl Achard, a pupil of Marggraf, improved upon his master's process, and in 1799 invented an elaborate process for extracting sugar from the beet on a large scale.⁴ Achard had succeeded in enlisting the support of Frederick the Great in his experiments. Through the substantial support of his new process on the part of Frederick William III, a small factory with a capacity of 4,400 pounds of beets daily was erected at Cunern, Silesia, the first beet sugar factory in the world.⁵

Achard's reports produced great excitement in Europe. Napoleon Bonaparte appointed a commission of ten members from the French National Institute to investigate the merits of the discovery. While the findings of this commission did not bear out all of Achard's claims, yet two small factories were built near Paris, and for ten

1. *Harper's Weekly*, LIV, 24.

2. Palmer, Truman G., *Concerning Sugar*, C14.

3. *Ibid.*, C14.

4. Jodidi, S. L., *Sugar Beets and Beet Sugar*, 1.

years field and factory experiments were carried on under the direction of M. Maximan Isnard. When, in 1811, Isnard's report was submitted to Napoleon, this farsighted statesman saw at once the tremendous possibilities in the sugar beet. He knew the dependence of France upon the sugar from the tropics, especially the West Indies. This supply was cut off now owing to England's continental blockade, and sugar was selling in France for \$1.00 per pound.⁶ Moreover, France was on the verge of starvation. The old three-field system of agriculture was still in use with all its waste, the soil worn out, and the crop yields low.

Such were the circumstances in France at the time, and Napoleon realized that a large scale cultivation of the beet would not only make France independent of tropical sugars, but would also restore fertility to her soils. So, by a series of decrees, Napoleon virtually became the father of the beet sugar industry. The first of these was issued March 18, 1811. In this he commanded his Minister of the Interior to encourage sugar beet culture by modifying the tariff or prohibiting importation of any colonial sugar, to establish schools for the teaching of beet sugar manufacture, and to devote 60,000 arpents (75,000 acres) to sugar beet growing.⁷

On March 23, 1811, Napoleon appropriated one million francs (\$200,000) for the establishment of six technical beet sugar schools, and forced the peasants to plant 32,000 hectares (79,000 acres) to sugar beets the following season.⁸ Sugar importation from the Indies was prohibited after January 1st, 1813.⁹

January 15th, 1812, Napoleon decreed that 100 students should be selected from schools of medicine, pharmacy, and chemistry, and transferred to his technical beet sugar schools, and that 150,000 acres be sown to beets. Financial inducements were also to be made to scientists for the further perfection of the process of manufacture, and to capitalists to engage in the industry. Appropriation was also made for four imperial beet sugar factories.¹⁰

Raising sugar beets at once became popular.¹¹ Early in 1812, forty factories were in operation, working 98,813 tons of beets annually, with a total output of 3,300,000 pounds of sugar.¹² In 1913, the number of factories in France had reached 334, and the output 7,700,000 pounds of refined sugar.¹³ In this one year France

5. Cf. Palmer, T. G., *op. cit.*, C14, and Jodidi, S. L., *op. cit.*, 2.

6. Cf. Jodidi, S. L., *op. cit.*, 2, and Palmer, T. G., *op. cit.*, C14.

7. Palmer, T. G., *op. cit.*, C14.

8. *Ibid.*, C14.

9. Continental System no longer in force.

10. Palmer, T. G., *op. cit.*, C15.

11. As all other constructive enterprises are all more or less subjected to ridicule at the beginning, so the beet sugar industry came in for its share. A contemporary cartoon shows a stern nurse holding to the lips of the infant King of Rome a sugar beet, with the admonition, "Suck it, dear, your father says it's sugar!" See *Facts About Sugar*, III, 311, (Nov. 18, 1916.)

12. Jodidi, S. L., *op. cit.*, 2.

13. Palmer, T. G., *op. cit.*, C15.

erected four times as many factories as the United States has in the first eighty years after the erection of the first factory.¹⁴

The creation of such a great industry is one of Napoleon's greatest achievements, and from the standpoint of usefulness and constructive statesmanship outweighs his conquests and ranks well with his Code. Indeed, it has been said that he would go down in history with the Code of Napoleon in one hand and a sugar beet in the other.

This flourishing industry received a temporary setback with the annulment of the continental blockade and the downfall of Napoleon. Cane sugar on the European markets was very cheap, and this was a severe blow to the new industry. Several factories were compelled to close. Sugar factories in Germany were converted into industrial establishments, but in France, owing to more advanced methods of sugar extraction and refining, some factories survived.¹⁵ When, about 1825-1830, the price of grain fell, the farmers took up beet raising again, and from that time until the present war the industry has been constantly expanding.

Experiments in sugar beet growing spread to other countries of Europe: to Austria-Hungary, Belgium, Holland, Russia, Denmark, Sweden, Italy. All of the European countries except Norway and England raise the sugar beet for commercial production.

From such modest beginnings, the sugar beet industry has grown rapidly, until preceding the outbreak of the great war several countries in Europe produced enough for home consumption and had some to spare for exportation.¹⁶ The following statistics from the chief beet sugar producing countries of Europe will show to what extent the production has increased from such small beginnings. Incidentally, it will also show the effects of the war upon the output:

TABLE SHOWING PRODUCTION OF RAW SUGAR IN SOME OF THE EUROPEAN COUNTRIES, 1913-1917¹⁷

	[In Tons of 2,000 Pounds]				
	1836	1916-17	1915-16	1914-15	1913-14
Germany	1,500	1,653,450	1,543,220	2,755,750	3,003,768
Russia .....	.....	1,377,875	1,617,180	2,196,637	1,918,433
Austria-Hungary ....	.....	1,041,674	1,114,866	1,766,252	1,865,092
France	40,000	203,926	149,801	333,954	860,892
The World, Beet Sugar .....	.....	6,147,123	6,421,912	9,051,767	9,827,006

Not only has tonnage been increased but the per cent of sugar in the beet is greater. Whereas, in 1836-1837 the per cent of

14. Palmer, *op. cit.*, E34.

15. To be exact, only two factories survived. See Freeman, W. G., and Chandler, S. B., *World's Commercial Products*, 108; *Facts About Sugar*, III, 311.

16. Previous to the war Germany exported on the average 872,888 tons of raw and refined sugar, or 37% of her production; Austria-Hungary exported 848,629 tons, or 51%; Russia, 293,156 tons, or 18% of her output. Compiled from U. S. Bureau of Foreign and Domestic Commerce, *Miscellaneous Series*, No. 53, *The Cane Sugar Industry*, 442-444.

17. Palmer, T. G., *op. cit.*, C25.

sugar content in Germany was only 5.55, in 1906-1907 it averaged 14.86, and in later years has been even better than this.¹⁸

The reason for this has been two-fold. The farmers were inexperienced in sugar beet growing and supplied the factory with a very poor beet. It is the grower who helps nature to store sugar in the beet by intelligent cooperation in the process. The manufacturer only extracts the sugar. But here was the second drawback: factory managers were also inexperienced and lost a great part of the sugar by inferior methods of extraction. Both of these problems have been solved, the farmer raising beets high in sucrose, and the manufacturer extracting as high as 98 per cent of the same.

B. IN THE UNITED STATES

The earlier experiments in growing sugar beets and manufacturing sugar from the beet in the United States met with the same discouragements as were encountered in Europe. The story to 1888 is one of small establishments and numerous failures. Enterprise after enterprise was launched with buoyant hope and enthusiasm only to meet with the bitter discouragement of failure. Yet failure was only temporary; for with boundless energy, courage, and endurance the pioneers in the industry left a legacy of experience pointing out the shoals and dangers and making final success possible.¹⁹

Three facts contribute to these early failures:²⁰

1. Because of a lack of scientific information the methods of culture and extraction were crude;
2. Many experiments were made in parts of the country where conditions of culture were not favorable;
3. Competition with tropical sugars, the production of which was established.

The modern period began in 1888. In contrast with the small undertakings and failures of the previous period stand the large factories and phenomenal successes of this period. There were several factors contributing to this success:²¹

1. The time was ripe; the conditions were better understood,

18. Jodidi, S. L., *op. cit.*, 5.

19. Mr. E. H. Dyer had four failures in 19 years. See Palmer, T. G., *op. cit.*, E37. The following list presents the losses due to early failures in the beet sugar industry:

1830, Philadelphia	\$100,000	1878, Delaware	100,000
1838, Northampton	100,000	1878, Portland, Me.	100,000
1863, Chatsworth	175,000	1892, Staunton, Virginia ..	100,000
1870, Fond du Lac	35,000	1896, Eddy, N. Mex.	200,000
1870, In New Jersey	100,000	1896, Menominee Falls ..	200,000
1870, Alvarado	250,000	1897, Rome, N. Y.	200,000
1870, Sacramento,	75,000	1899, Pekin, Ill.	50,000
1871, Black Hawk	75,000		
1873, Isleton,	100,000		
1875, Soquel	75,000		
			<hr/>
			\$2,110,000

The above figures probably show half the amount actually lost; the actual figures will never be known, perhaps. See Saylor, F. C., *Progress of the Beet Sugar Industry*, 1902, U. S. Dept. of Agri. Report No. 74, p. 83.

20. Saylor, F. C., *op. cit.*, 77.

21. *Ibid.*, 78.

and the efforts more intelligently directed,—we were better acquainted with soils and demands of the industry;

2. The cost of production was reduced and the difficulty of competing with cane sugar was reduced;

3. Our situation was superior to that of Europe in that we had virgin lands at lower cost;

4. The habitat of the sugar beet brought to the manufacturer the highest possible scientific help and investigation.

The first attempt to grow sugar beets in this country was at Ensfield, near Philadelphia, in 1830.²² It was a failure. In 1836, another attempt was made near Philadelphia by James Ronaldson, who, in association with several other men, sent an agent to France to study the beet industry. Six hundred pounds of seed were sent from France and sown, but no lasting results came of the experiment.²³

While M. Isnard was conducting one of Napoleon's sugar schools at Strassburg, two Americans from Northampton, Massachusetts, Messrs. Edward Church and David Lee Child, became acquainted with him, and were interested in the industry. In the late thirties, after these men had returned to the United States, Isnard was appointed Vice-Consul at Boston, and their acquaintance was renewed. All were interested in the beet sugar industry, and a factory was erected at Northampton, Massachusetts, 1838.²⁴ Here was produced the first beet sugar in this country. Seed was imported from France and distributed to the farmers. This first yield netted thirteen to fifteen tons per acre, with a sugar content of seven and one-half to nine per cent.²⁵ The next year 1,300 pounds of sugar were produced, and the Massachusetts Agricultural Society awarded the company a \$100 prize for having produced "from the sugar beet beet sugar in the greatest quantity and best quality in 1839."²⁶ The enterprise was not a success, however, and was abandoned in 1840.²⁷

In 1836, the Gennert Brothers, from Germany, selected 2,300 acres of prairie land in the vicinity of Chatsworth, Illinois, and began beet culture. Backed by a banker they erected a factory of fifty tons capacity. Due to a series of bad harvests, coupled with insufficient equipment in the factory, the extraction was low, and the enterprise was given up. The factory was moved to Freeport, Illinois, for one season, then to Black Hawk, Wisconsin, and later a portion of the machinery reached California.²⁸

During the early period of the industry, factories were also

22. Jodidi, S. L., *op. cit.*, 6.

23. Palmer, T. G., *op. cit.*, C25.

24. *Ibid.*, E34 and E35.

25. Myrick, Herbert, *The American Sugar Industry*, 31.

26. Palmer, T. G., *op. cit.*, E35.

27. Saylor, F. C., *op. cit.*, 79.

28. Myrick, Herbert, *op. cit.*, 31.

erected in Utah,²⁹ Maine, New Jersey, Delaware, Wisconsin, and California. All except one factory at Alvarado, California, were failures. At Fon du Lac, Wisconsin, Messrs. Bonesteel and Otto erected a small factory, made some sugar and then shipped the machinery to Alvarado, California,³⁰ where the first successful enterprise in the United States was launched in 1870.³¹

Heretofore the Government had not seen fit to assist the struggling industry. When at last it decided to establish an indigenous sugar industry, the Secretary of Agriculture took the wrong cue, and decided that sorghum was the future sugar producing plant. A great amount of money was spent in advertising its sugar possibilities, and a veritable sorghum craze resulted. This had to be killed before the country could be placed on the right track: this task was assumed by Dr. Lewis S. Ware, of Philadelphia, a brilliant chemist and engineer.³² He threw himself into the work with great enthusiasm, even spending \$50,000 from his own private fortune in printing and circulating millions of pamphlets, and importing and distributing to farmers, free of charge, several tons of sugar beet seed. He was successful: the Department of Agriculture was convinced of its mistake, and it gave the new enterprise its strong cooperation. This cooperation was especially favorable, beginning with the secretaryship of Mr. James Wilson in 1897, whose efforts to draw capital into this field were unceasing.

Another ardent believer in the sugar beet was Dr. Harvey W. Wiley, Chief Chemist of the Department of Agriculture 1874-1913. His scientific analyses were published and distributed widely, aiding both grower and manufacturer. From the findings of an analysis of 8,000 beets from forty-four states, he published a map showing the theoretical sugar beet area of the United States.³³ While sugar beets are grown outside this theoretical area, the best beets are grown in it, and it contains practically all of the sugar beet factories in the country.³⁴

In spite of encouragement from the Federal and State Departments of Agriculture and interested individuals of prominence, the real development of the beet sugar industry dates from 1890. Prior to this date we produced only about one-tenth of our sugar at home, most of this being cane. In that year further impetus

29. The experiment in Utah is of interest, first, because it was operated by the Mormon Church; second, because of the adventures in shipping the machinery. The machinery was valued at \$12,500, and was purchased in Liverpool, England, shipped to and unloaded at New Orleans, thence sent by river boat to Fort Leavenworth and unloaded. A caravan of 52 ox teams took it from this place, but on the way to Utah the cattle ran away, stampeded, and 80 died. The way was lost and the caravan came to Oregon. At one time three weeks were spent in traveling 40 miles. In November the caravan came to Provo, and the plant was erected here, but later it was moved to Salt Lake City. It operated till 1855. For a fuller account see Dept. of Agri. Report No. 74, 79-81.

An interesting and instructive article on the Relation of the Mormon Church to the Sugar Trust is given by J. C. Welliver in *Hampton's*, XXIV, 82-89.

30. Myrick, Herbert, *op. cit.*, 31-32.

31. Shaw, G. W., *California Sugar Industry*, I, 7.

32. Palmer, T. G., *op. cit.*, E37.

33. Wiley, H. W., *The Sugar Beet*, U. S. Dept. of Agric., Farmers' Bull. No. 52, p. 5

34. Palmer, T. G., *op. cit.*, E37.

was given the industry by substitution for the importation duty of 2c a pound in 1888, a bounty of 2c a pound to the sugar producers.³⁵ Several states followed the lead of the Federal Government, and added to the Federal bounty a State bounty.³⁶ The Federal bounty in the tariff of 1890 was removed in 1894, but protection was maintained in this act, and also in those of 1897 and 1909.³⁷

The real impetus to the industry as a practical commercial enterprise, aside from those mentioned above, was furnished by the Oxnard Brothers, Henry T. and James G. Oxnard. These men had large experience as sugar refiners, had made extensive studies of the beet sugar industry abroad, and became convinced of its possibilities here. They possessed enthusiasm and ability, and began to conduct a campaign of education. Three factories were erected by them: at Grand Island, Nebraska, 1890; Norfolk, Nebraska; and Chino, California, 1891.³⁸ The American Beet Sugar Manufacturers' Association was organized by them in 1891³⁹ to unite the beet sugar producers and to secure mutual cooperation, and an office was established in Washington to keep in close touch with Congressional action relative to sugar.⁴⁰ It was through the action of Mr. H. T. Oxnard, and those working with him, that favorable legislation was secured in 1890.⁴¹

C. IN CALIFORNIA

Because of the failure of all attempts at sugar beet growing and manufacture outside of California prior to 1888, the opinion was prevalent that the beet could not be grown profitably in any other State. In that year there were only two factories in the United States, and both of those were located close to San Francisco.⁴²

The plant at Alvarado, California, was established in 1870 by Mr. E. H. Dyer. Part of the machinery from the abandoned enterprise at Fon du Lac, Wisconsin, and the remainder was imported. The California Beet Sugar Company was organized with a capital stock of \$250,000, the factory, with a capacity of fifty tons of beets per day, was erected at a cost of \$125,000, and sugar was manufactured on November 17th, 1870, the first sugar to be made in this State.⁴³ In the first year 1,000 to 1,500 acres⁴⁴ of beets, for which the

35. Taussig, F. W., *Tariff History of the United States*, 276.

36. Cherington, P. T., *Q. J. Econ.*, XXVI, 381-386.

37. Taussig, F. W., *op. cit.*, 309-313; 350; 395-397.

38. Jodidi, S. L., *op. cit.*, 34.

39. Myrick, Herbert, *op. cit.*, 34.

40. Mr. H. T. Oxnard was in charge of the Washington office until 1911, when it was turned over to Messrs. T. G. Palmer and C. C. Hamlin. Mr. Palmer is now in charge. Mr. Oxnard, according to his testimony before the Senate Committee, had spent in 23 years \$460,000 in Washington to influence legislation. The books had been destroyed so that it was not possible to ascertain how this money had been spent. See Thomas, C. S., in *World's Work*, XXVI, 542-543.

41. Myrick, Herbert, *op. cit.*, 43-45.

42. Palmer, T. G., *op. cit.*, E37.

43. Shaw, G. W., *op. cit.*, I, 8-9.

44. Palmer, T. G., *op. cit.*, E35.

company paid \$3.50 per ton, were planted, and 500,000 pounds of sugar were produced at a cost of 10 cents per pound.⁴⁵ Because of internal difficulties in the company this enterprise was a financial failure. The eastern parties interested in the factory transferred their part of the capital to Soquel, Santa Cruz County, and there, together with some San Francisco capitalists, erected another factory in 1874.

The Sacramento Valley Sugar Company lost the distinction of being the first to manufacture sugar in this State because of a decision to delay a year in the erection of its factory. At Brighton this company erected a factory in 1871, at a cost of \$250,000, and with a slicing capacity of seventy tons of beets per day.⁴⁶ This was the first plant in the United States to use the diffusion battery system for extracting the sugar, which is now in universal use.

In 1877 a factory was erected on an island in the lower Sacramento River, Isleton, for the purpose of extracting sugar from watermelons. This was not successful, and attention was turned to beets, but because of the impracticability of raising beets on inundated land the plant was closed in 1877, and was definitely abandoned after another campaign in 1880.⁴⁷

Meantime the Brighton plant had closed down in 1875, after four years of discouragement. The Soquel factory produced sugar from 1874 to 1880 but went bankrupt in 1880. The Alvarado factory struggled on in the face of numerous difficulties following the difficulty among the directors of the company in 1874. After the failures at Brighton in 1875 and Soquel in 1880, this pioneer plant has the additional distinction of being the only beet sugar plant in existence and operation in the United States from 1880 to 1887. In 1879 Mr. E. H. Dyer purchased from the old Alvarado company the factory and equipment and organized the Standard Beet Sugar Company with a capital of \$100,000. Finding this capital inadequate, he reincorporated under the name of The Standard Sugar Refining Company, increased the capital stock to \$200,000, and enlarged the factory to a capacity of 100 tons of beets daily. Although hindered by active opposition on the part of individuals who were opposed to the undertaking, and by keen competition with cheaper Hawaiian sugar, the company nevertheless was a financial success until 1884. During the following two years it had a struggling existence, and in 1886 the enterprise paid no dividends. A severe boiler explosion in 1886 bankrupted the company.⁴⁸ Next year The Pacific Sugar Company was organized and a new factory erected and operated one year. It was then sold to The Alameda Sugar Company, which still owns the factory.⁴⁹

45. Shaw, G. W., *op. cit.*, I, 9.

46. *Ibid.*, 10; Also Palmer, T. G., *op. cit.*, E36.

47. Shaw, G. W., *op. cit.*, 11-12.

48. *Ibid.*, 13.

49. Shaw, G. W., *op. cit.*, 11-13.

In 1888 Mr. Claus Spreckels, a German of considerable experience in the sugar business, interested in Hawaiian sugar, recognized that it would only be a matter of years before the beet sugar would be in competition with the cane. He therefore decided to enter into the beet sugar industry also, and established a factory at Watsonville, California, until 1898 the largest factory in the country. In that year Mr. Spreckels organized The Spreckels Sugar Company, into which was merged The Western Beet Sugar Company at Watsonville, and an immense factory was erected at Salinas, now renamed Spreckels.⁵⁰ This factory has now a capacity of 4,500 tons of beets per day, and is the largest beet sugar factory in the world.⁵¹ The factory at Watsonville was equipped both as a beet sugar factory and a refinery. Between "campaigns"⁵² it refined imported raw sugars, thus keeping the factory in constant operation. This factory was very fortunately located, the rich Pajaro Valley being ideal sugar beet land, but with the erection of the large factory at Salinas the Watsonville factory was closed and all the beets from the Pajaro Valley were sent to Spreckels.

Experiments carried on with beet growing in Southern California had been successful, and in 1890 the Oxnard Brothers formed The Chino Sugar Company and erected a plant at the present location of the city of Chino, which was then an open valley devoted to cattle raising.⁵³ This factory began operation in 1891, when 13,086 tons of beets were received from 1,800 acres of land, for which the company paid \$51,035.⁵⁴

The Oxnard Brothers began another factory at Oxnard in 1897, under the control of The Pacific Beet Sugar Company. However, in 1898, when this factory made its first run, The American Beet Sugar Company was organized and took over all the factories of the Oxnards, which numbered six, including the two at Chino and Oxnard. The original capacity of the Oxnard factory was 2,000 tons per twenty-four hours. It has been enlarged recently and now has a capacity of 3,000 tons, next to Spreckels' the largest factory in the State,⁵⁵ and by some authorities held to be the model

50. Saylor, F. C., *Progress of the Beet Sugar Industry in the United States in 1899*, H. of Rep. Doc. 699, 56th Cong. 1st Sess., 18.

51. Palmer, T. G., *op. cit.*, C25.

52. The period during which the factories are in operation extracting the sugar from the beets is called "campaign". It lasts on the average 100 days in California. The Los Alamitos factory campaign of 1917 lasted 120 days.

53. There are at least six towns in California which owe their existence to the beet sugar industry, each of which grew up around a beet sugar factory:

(a) Oxnard, 17 years ago a large plant located on an open grain ranch; to-day it is a model town of about 5,000 population.

(b) Chino, formerly a cattle country.

(c) Spreckels, a vast open valley once.

(d) Hamilton, Glenn County, formerly an unbroken waste of abandoned grain fields.

(e) Los Alamitos, located on waste lands, nesting places for ducks and geese, and overgrown with bullrushes.

(f) Betteravia, once an open valley.

(g) Santa Ana owes at least part of its growth to two sugar factories.

See Edwards, P. L., What the Beet Sugar Industry is doing for this country, *Overland*, N. S., LXIII, 556-557; also Myrick, H., *op. cit.*, 40; and Shaw, G. W., *op. cit.*, 26, 29, 35, 44.

54. Shaw, G. W., *op. cit.*, 26.

55. Myrick, Herbert, *op. cit.*, Illus. III and opposite p. 1.

beet sugar factory in the country by virtue of its up-to-date machinery, the arrangement of this machinery and the buildings.⁵⁶

In 1897 the Bixby Land Company, the owners of the Los Alamitos Rancho, contracted to guarantee a sufficient supply of beets for five years as an inducement for the establishment of a factory on the ranch.⁵⁷ Accordingly, Mr. J. Ross Clarke of Butte, Montana, organized The Los Alamitos Sugar Company and erected a factory of 350 tons capacity. Three thousand acres were placed under beet cultivation, 29,542 tons of beets, having a sugar percentage of 15.73 and a purity of 82 per cent, were sliced, and over 6,000,000 pounds of sugar manufactured.⁵⁸ The factory was increased to 700 tons capacity in 1898, and recently another additional enlargement has been made, so that the present slicing capacity is 800 tons per twenty-four hours.⁵⁹

The sixth successful sugar factory in California was located in Betteravia, in the Santa Maria Valley, Santa Barbara County, in 1899. The factory capacity was then 500 tons per twenty-four hours, but it has since then been increased to 1,000 tons.⁶⁰ It was built by The Union Sugar Company, which still owns the factory. The report from the factory discloses an unusually prosperous 1917 campaign.⁶¹

The high grade of beets raised in California soon proved the preëminent fitness of this State for sugar beet culture. Consequently, the beet acreage has constantly been on the increase, and new factories established, until at the present time (1918) there are in California fifteen large beet sugar mills. The location and date of erection of six of these have been touched upon above. The other nine are located as follows: Hamilton City (1906), Visalia (1906), Corcoran (1908), Santa Ana (1908), Huntington Beach (1911), Anaheim (1911), Dyer [Santa Ana] (1912), Manteca (1917), Tracy (1917). The total slicing capacity of these factories is 18,350 tons per twenty-four hours,⁶² which can easily be increased to 20,000 tons per twenty-four hours if occasion demands. The location of each factory, its date of erection, original and present owners and present slicing capacity is summarized in the following table:

56. *Facts About Sugar*, III, 319. (Nov. 18, 1916); also Myrick, H., *op. cit.*, opposite p. 1.

57. Myrick, Herbert, *op. cit.*, 50.

58. Palmer, T. G., *op. cit.*, C25.

59. Shaw, G. W., *op. cit.*, 29.

60. *Ibid.*, 44.

61. *Facts About Sugar*, V, 353, (Nov. 3, 1917.)

62. Palmer, T. G., *op. cit.*, C25.

CALIFORNIA BEET SUGAR FACTORIES, 1917

Date of Com- pletion	Town	Slicing Capacity	Original and Present Owners ⁶³
1870, Alvarado	800	Pacific Coast Sugar Mfg. Co. ' Alameda Sugar Co.
1891, Chino	1,100	Chino Valley Beet Sugar Co. American Beet Sugar Co.
1897, Los Alamitos	800	Los Alamitos Sugar Co. (Same)
1898, Oxnard	3,000	Pacific Beet Sugar Co. American Beet Sugar Co.
1899, Spreckels	4,500	Spreckel's Sugar Co. (Same)
1899, Betteravia	1,000	Union Sugar Co. (Same)
1906, Hamilton City	700	Alta California Beet Sugar Co. Sacramento Valley Sugar Co.
1906, Visalia	400	Pacific Sugar Corporation San Joaquin Valley Sugar Co.
1908, Santa Ana	600	Colonial Sugar Co. Southern California Sugar Co. Holly Sugar Corporation
1908, Corcoran	600	Pacific Sugar Corporation ' Pingree Sugar Co.
1911, Huntington Beach	1,200	Holly Sugar Co. Holly Sugar Corporation
1911, Anaheim	850	Anaheim Sugar Co. (Same)
1912, Dyer (Santa Ana)	1,200	Santa Ana Cooperative Sugar Co. Santa Ana Sugar Co.
1917, Manteca	1,000	Spreckel's Sugar Co.
1917, Tracy	700	Pacific Sugar Corporation

Eight of the factories of the State are located south of the Tehachapi. Their combined slicing capacity is about 10,000 tons per twenty-four hours, and their properties represent an investment of over \$12,000,000. Over one-half of the 200,100 tons of refined sugar produced in California in 1917 were produced in the southern part of the State. There were 154,700 acres⁶⁴ under beet cultivation in the State, and of these about 100,000 were in the South, Orange County laying claim to one-half of the acreage. Following Orange County in the order of their acreages were Los Angeles, Ventura, Santa Barbara, San Bernardino, Riverside, and San Diego Counties.

63. Original owners are given first; present owners last.

64. Palmer, Truman G., *Concerning Sugar*, E3. (Feb. 1918).

Orange County has also the distinction of being the home of five of the eight Southern California factories.

Due to a series of unfortunate circumstances the relations between the sugar manufacturers and the beet growers were not very cordial in the year just passed (1917). The crop, which has averaged ten tons to the acre, fell to about eight tons. To a certain extent this may be charged to unfavorable weather conditions and lack of irrigation water when needed, as in the San Fernando Valley. More serious than this, perhaps, were the labor conditions. There was uneasiness among the Mexican beet thinners, who, in many sections, refused to thin beets at greatly increased wages. As the growers' contracts with the factories are signed prior to planting, the effects of these unfortunate conditions fell upon the shoulders of the farmers, and not the manufacturers.

When local growers signified their intention not to plant sugar beets this year (1918), even at the patriotic appeal of Mr. Herbert Hoover, the Federal Government began an investigation to ascertain the correctness of the growers' charges that it was impossible to raise beets at the prices offered by the factories. The Los Angeles and Orange County Grand Juries made investigations and reported that the factories were reaping undue high profits. No agreement could be reached between the two factions relative to the 1918 contract,⁶⁵ and so Mr. Hoover appointed a commission⁶⁶ to investigate the cost of raising beets, and to establish a just price which the sugar companies should pay for the beets. This price, however, was only to be recommended to the factories; it was not to be binding.

After a thorough investigation, the commission reported that the cost of raising beets averaged \$84 per acre, and added to this a profit of \$16, making a total of \$100 which the sugar companies should pay for an acre of average 15 per cent beets, or \$8.25 per ton. In addition to this base price, the bonuses offered by the factories should be paid.

California can well afford to foster an industry which gives employment to thousands of its citizens, and which has drawn into its channels millions of dollars of capital. The Federal Government could ill afford to minimize the importance as a national war asset of the industry in a State which contained 22.9 per cent of all the land given over to sugar beet raising in the country, and which produced (1917) 23.7 per cent of all the beet sugar in the country. With harmony between the growers and manufacturers, California is destined for an even greater future as a sugar producing state, and again to regain the lead which was lost to Colorado a few years ago.

65. This contract offers \$7.50 per ton for 15% beets, with an addition or deduction of 50c for each 1% above or below 15%. In addition, should sugar go over \$7 a cwt. the growers will receive a bonus of \$1 for each dollar advance over \$7.

66. The commission consisted of Mr. Prescott F. Cogswell of El Monte, Judge Merle Rodgers of Ventura, and Mr. John M. Perry of Stockton.